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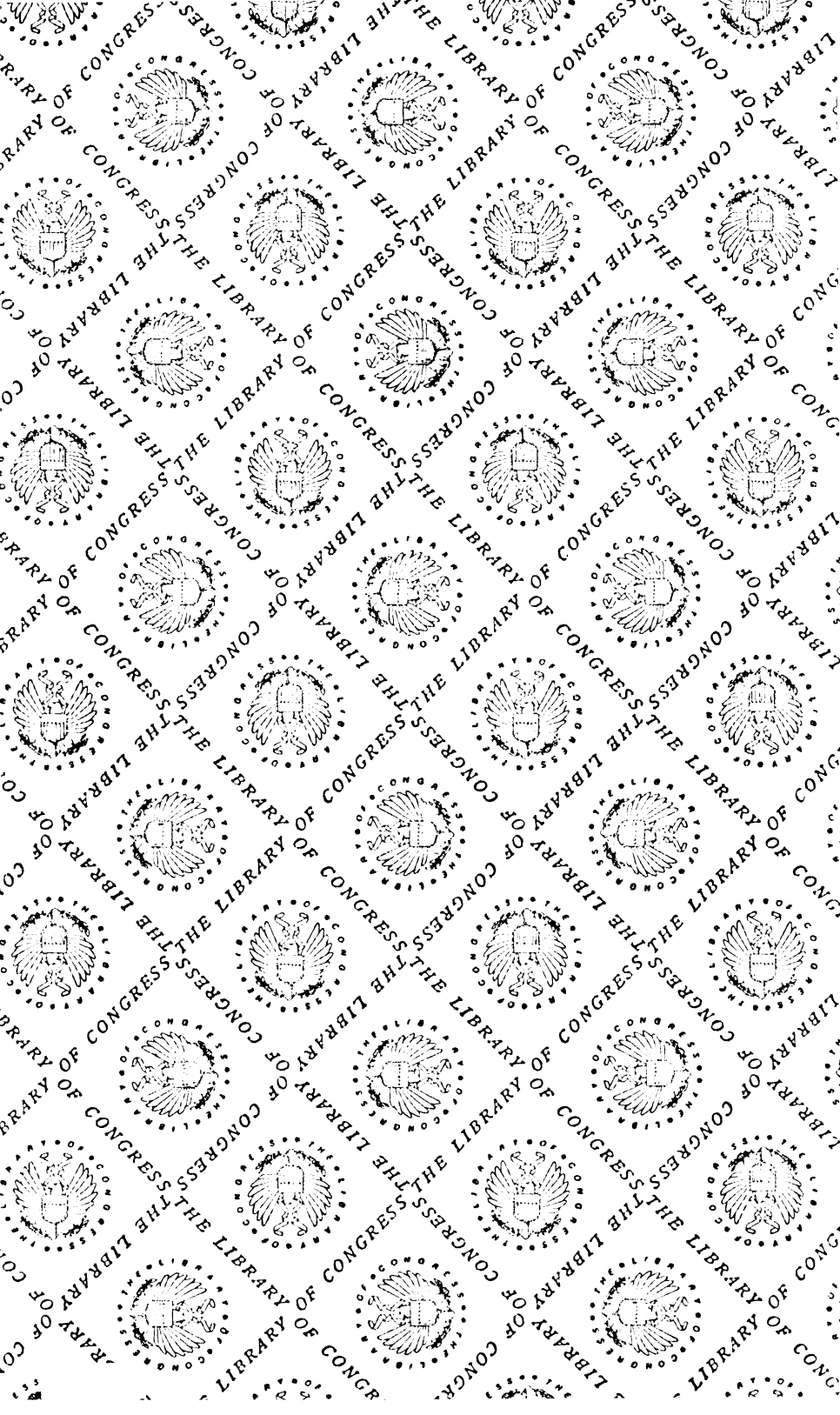
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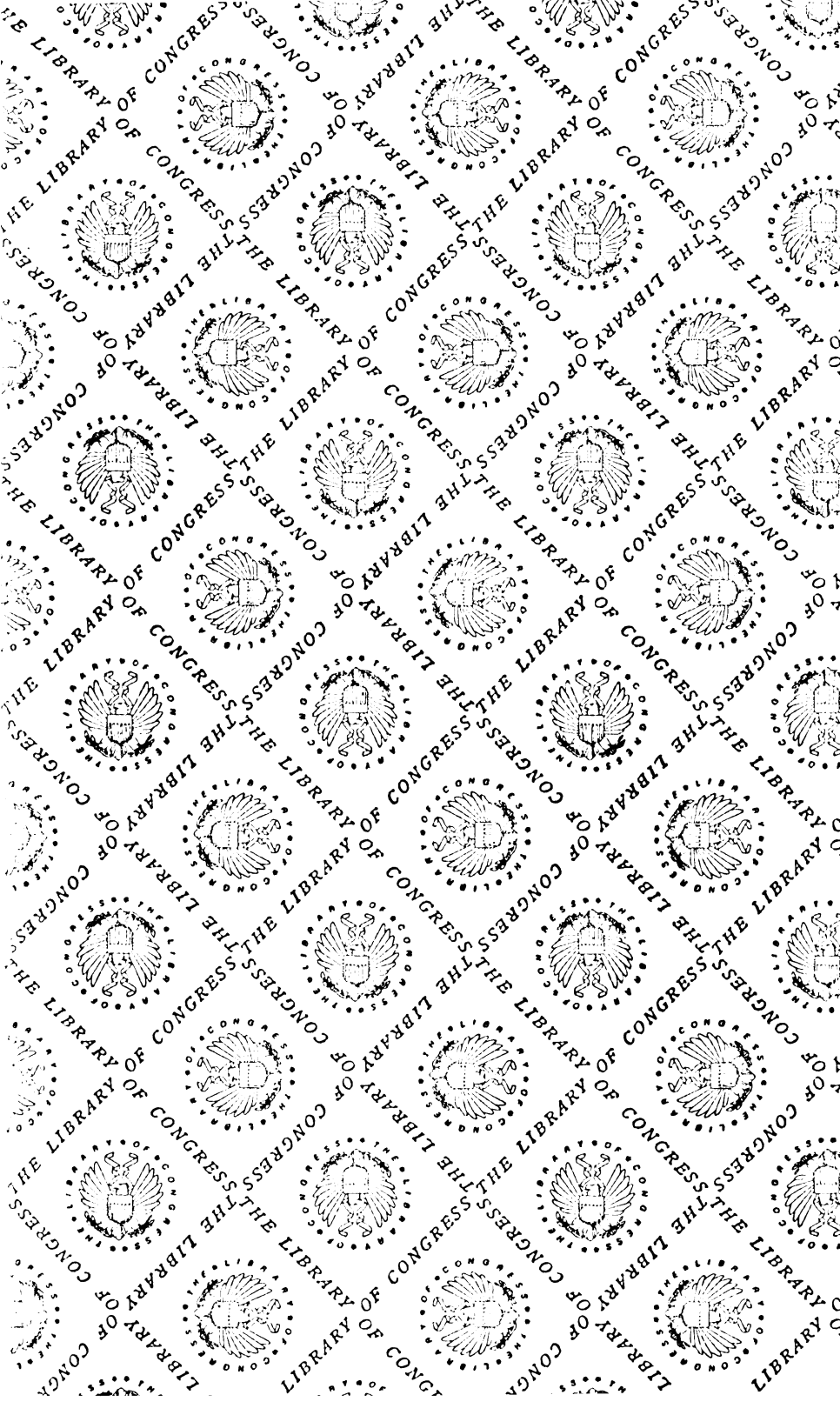
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FORTIFICATIONS APPROPRIATION BILL

HEARING

U.S. Congress, Senate,
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BEFORE THE

SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS UNITED STATES SENATE

SIXTY-FOURTH CONGRESS

FIRST SESSION

ON

H. R. 14303

A BILL MAKING APPROPRIATIONS FOR FORTIFICATIONS AND
OTHER WORKS OF DEFENSE, FOR THE ARMAMENT
THEREOF, FOR THE PROCUREMENT OF HEAVY
ORDNANCE FOR TRIAL AND SERVICE,
AND FOR OTHER PURPOSES

Printed for the use of the Committee on Appropriations

WASHINGTON
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1916

SUBCOMMITTEE ON FORTIFICATIONS BILL.

NATHAN P. BRYAN, Florida, *Chairman.*

ROBERT L. OWEN, Oklahoma.

GEORGE T. OLIVER, Pennsylvania.

JOHN WALTER SMITH, Maryland.

WESLEY L. JONES, Washington.

OSCAR W. UNDERWOOD, Alabama.

CHARLES E. TOWNSEND, Michigan.

KENNEDY F. REA, *Clerk.*

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FORTIFICATIONS APPROPRIATION BILL.

FRIDAY, JUNE 23, 1916.

UNITED STATES SENATE,
SUBCOMMITTEE ON APPROPRIATIONS,
Washington, D. C.

The subcommittee met in the committee room, at the Capitol, at 10 o'clock a. m., pursuant to call, Senator Oscar W. Underwood presiding.

Present: Senators Underwood (acting chairman), Oliver, Jones, and Townsend.

Also present: Brig. Gen. William Crozier, Chief of Ordnance, United States Army.

The committee proceeded to consider the bill (H. R. 14303) making appropriations for fortifications and other works of defense, for the armament thereof, for the procurement of heavy ordnance for trial and service, and for other purposes.

FORTIFICATIONS AND OTHER WORKS OF DEFENSE.

STATEMENT OF BRIG. GEN. WILLIAM CROZIER, CHIEF OF ORDNANCE, UNITED STATES ARMY.

Gen. CROZIER. The bill as it passed the House of Representatives appropriates \$2,700,000 for the purchase, manufacture, and test of ammunition for mountain, field, and siege cannon, etc., and authorizes obligations to the extent of \$1,500,000 in addition, making \$4,200,000 in all. The estimates as they were originally submitted, last autumn, related to the War Department's plans of military preparation as they existed at that time, including what has been popularly called the "continental army," and other features. Later on, at the time of my hearing before the Appropriations Committee of the House of Representatives, there was considered a different force. Now, as the national-defense bill has been enacted into law, I compute that the field artillery ammunition still necessary to supply the regular force contemplated by the bill, the reserve for that force, and certain special purposes connected principally with the defense of the outlying possessions of the United States, will cost about \$60,000,000. The regular force contemplated would organize into about three active Army corps and three reserve Army corps, and if the total amount of ammunition for the three active Army corps should be supplied in four annual installments, the amount of the first installment should be one-fourth of three-fifths of \$60,000,000, or \$9,000,000, which is the amount which I think ought to be appropriated in this bill at this time.

The figures which I am now giving you would enable us to meet the provisions for the Regular Army as contemplated in the national-defense act, in accordance with the standards of the Treat Board, in the time which I have been mentioning to you.

Senator UNDERWOOD. As I understand it, then, your reason for increasing that amount over last December grows out of the fact that the provision for the Army in the Army reorganization bill is greater than it was then owing to the increase in the size of the Army?

Gen. CROZIER. Yes; and in addition to that, that our estimates when they were made corresponded to the Greble Board standard, and the estimates now made correspond to the Treat Board.

Senator UNDERWOOD. Then the total amount that is needed within the next seven years will be \$60,000,000 for the Army as it is now organized?

Gen. CROZIER. I think we would perhaps be justified in making that eight years.

Senator UNDERWOOD. Eight years?

Gen. CROZIER. Yes.

Senator UNDERWOOD. And three-fifths of that should go to the Regular Army?

Gen. CROZIER. To the active Regulars.

Senator UNDERWOOD. And two-thirds to the reserve Regulars?

Gen. CROZIER. And two-thirds to the reserve Regulars; yes, sir. The provisions for the Organized Militia I have left out of account altogether in what I have been saying to you, because they have been made in the Army bill, under a different appropriation.

Senator OLIVER. Then for this year you suggest that instead of \$2,700,000, an immediate appropriation of \$9,000,000 be made. The contract part is how much?

Gen. CROZIER. \$3,000,000.

Senator OLIVER. That is, \$6,000,000 cash and \$3,000,000 contract?

Gen. CROZIER. Yes.

Senator UNDERWOOD. I think we understand that item.

Senator OLIVER. What is next, General?

SERVICES OF DRAFTSMEN EMPLOYED IN THE DISTRICT OF COLUMBIA.

Senator UNDERWOOD. There is one question I want to ask you, about an item on page 4, before we pass it. There was an estimate made, which was omitted, "For not to exceed \$40,000 of the fund herein appropriated for armament of fortifications," to be "used in the War Department for services of draftsmen." Has that been provided for in the legislative bill?

Gen. CROZIER. Not entirely. That provision and one other I was going to deal with after I had gotten through with the appropriation items. I can take it up just as well now.

Senator JONES. That was a new item?

Gen. CROZIER. The House left it out.

Senator JONES. The House left it out.

Senator UNDERWOOD. I was just trying to find out whether there was any reason for putting that back in the bill or not.

Gen. CROZIER. I think there is, Senator. You will notice that is not an item of appropriation, but is simply an authorization.

Senator OLIVER. It is an authorization to use a part of the appropriation for preparatory purposes.

Gen. CROZIER. Yes; for the employment of draftsmen here in Washington. I would need no authorization to spend that sum of money to employ draftsmen to do this work elsewhere than in Washington.

Senator UNDERWOOD. I understand under the law you can not use an appropriation for employment in Washington?

Gen. CROZIER. Not unless specially provided for. I need that authorization, which does not make an increase in the appropriations. The place where the designing work of the Ordnance Department is done is here in Washington, in my office, where is the center of information. All the guns and carriages, etc., are designed here in my office, practically all of them, and these moneys have to be expended here in order to be efficiently expended. I have been getting, for a number of years, authorizations in the legislative bill to make this kind of expenditure out of appropriations made. This year I asked for, first, \$100,000, and then increased it to \$140,000, authorization of that kind; but at the time that this was asked nobody could tell which bill was going to be enacted into law first, the legislative bill or the fortifications bill, and I was anxious to get an authorization of at least a part of the amount in the first bill that you passed. I therefore had sums of money carried in the estimates, or stated in connection with the estimates, relating to both bills.

After I had originally made those statements of what authorizations I wanted made, we had a large new job which came before us, which needed a start, and that is the design of a turret to be placed along our Atlantic seacoast. The designs and drawings would cost fully \$40,000. Therefore the total sum covered by the two bills, which I was wanting, should have been increased from \$150,000 to \$190,000. As a matter of fact I have had authorized \$140,000 in the legislative bill, and therefore I should like to have the authorization to expend, not \$40,000, as here mentioned, but \$50,000, enough to bring the whole up to the \$190,000, which I have just mentioned.

Senator TOWNSEND. In the third line of that proviso you say, "such sum to be in addition to other amounts authorized." Should not that be made more clear?

Gen. CROZIER. That means to be in addition to the amount authorized to be expended in the legislative, executive, and judicial bill, the total of which is now \$140,000.

Senator TOWNSEND. That ought to be made more clear; otherwise does not that mean \$40,000 in addition to the appropriations herein mentioned?

Gen. CROZIER. No, sir. It does not increase the appropriations at all. It is to be expended out of the appropriations. Whatever the appropriation may be, this money is to be taken out of it and expended here in Washington. All that it relates to is the place where that money may be expended.

Senator TOWNSEND. I see that clearly, but I do not think one would necessarily get that inference from the reading of that proviso. Instead of that it is to be taken out of this appropriation, you say, "in addition to other amounts authorized." Do you mean other amounts authorized for this purpose?

Gen. CROZIER. Authorized to be expended in this way; yes.

Senator OLIVER. "For this purpose" I think would be all right.

Gen. CROZIER. "Authorized to be expended for this purpose," if you will put that in right at this point. I had another wording here. I can give you another wording that will perhaps make it a little clearer still:

Provided, That the services of skilled draftsmen, and such other services as the Secretary of War may deem necessary, may be employed in the office of the Chief of Ordnance to carry into effect the various appropriations for the armament of fortifications, to be paid from such appropriations, in addition to any other amounts that may be authorized to be so paid: *Provided*, That the entire expenditure under the authorization here made shall not exceed \$50,000.

Senator TOWNSEND. Let me see if I have that clear in what I have in mind. There is a certain appropriation made here for armament of fortifications and you want, out of that appropriation, \$50,000 for drafting purposes, and so on?

Gen. CROZIER. Here in Washington.

Senator TOWNSEND. Here in Washington.

Gen. CROZIER. Irrespective of the amount I may use for those purposes elsewhere.

Senator TOWNSEND. I think we can get that clearer. I do not think it is clear, exactly, although I think we all understand it.

Senator UNDERWOOD. It is like an appropriation under the Supervising Architect's Office. If we provide for a public building in New York City, there is a certain amount of the funds taken out for drafting, but it has got to be specially allowed to be expended in Washington, because the statute provides that there shall be no expenditure of this money in question, unless specially authorized.

Gen. CROZIER. Yes.

Senator UNDERWOOD. If you went to New York City and prepared these plans you would not need any authorization for drafting force.

Gen. CROZIER. Yes; and I am not saying anything about the total amount I use out of this appropriation for drafting, but only the amount I will use here in Washington.

Senator UNDERWOOD. That covers most of the amount, does it not?

Gen. CROZIER. Yes; that practically covers most of it.

Senator OLIVER. Why would it not be just as well to put, after that authorization of \$2,700,000, or as you want it to be, \$6,000,000, this language, "of which a sum not to exceed \$50,000 may be used for the employment of draftsmen in the office of the Chief of Ordnance at Washington"?

Gen. CROZIER. Because this does not relate to that particular item of appropriation alone. It relates to other appropriations. That is only for ammunition, whereas this is for seacoast artillery ammunition, etc. It relates to all the items in the bill.

Senator UNDERWOOD. This is not a part of a paragraph, but is a separate paragraph by itself.

MANUFACTURE OF AMMUNITION IN UNITED STATES ARSENALS.

Senator JONES. I want to ask about these other paragraphs. You may have gone over this before I came in this morning. I want to ask about this provision for the manufacture of ammunition in the arsenals.

Gen. CROZIER. Not necessarily in the arsenals alone; no, sir. It says, "For purchase, manufacture, and test of ammunition."

Senator JONES. Oh, yes; I know that; but I am referring now to the manufacture of the ammunition by the Government. I wanted to know how many arsenals are now fitted for the manufacture of powder.

Gen. CROZIER. One.

Senator JONES. Just one?

Gen. CROZIER. Yes; of powder.

Senator OLIVER. And other ammunition.

Senator JONES. What do you include under the term "ammunition"?

Gen. CROZIER. That has led to a good deal of discussion and to an opinion from the Attorney General. I guess, perhaps, a good colloquial definition is the technical definition: Material of any kind in such a state of manufacture that it is appropriate for turning into ammunition alone, and not into other commercial articles.

Senator JONES. You have just used the word "ammunition" in your definition. You were starting to define the word "ammunition." That is what I want to get at.

Gen. CROZIER. Powder is ammunition and projectiles are ammunition.

Senator JONES. Projectiles are ammunition, also?

Gen. CROZIER. And brass cartridge cases are ammunition, but brass is not necessarily ammunition. You call any material ammunition when it is in such a stage of manufacture that it is useful in general for no other purpose than—

Senator UNDERWOOD. Producing explosions?

Gen. CROZIER (continuing). To provide what shall be fired in a firearm—to provide what shall be fired from a firearm, rather.

Senator JONES. You provide at which of your arsenals for the manufacture of some form of ammunition?

Gen. CROZIER. Three, in any considerable quantity.

Senator JONES. What are they?

Gen. CROZIER. The Picatinny Arsenal, at Dover, N. J., is the Army's only powder factory.

At the Frankford Arsenal is a factory which manufactures small-sized artillery ammunition, both field and seacoast.

At the Watertown Arsenal is a factory which manufactures projectiles for seacoast artillery ammunition.

Almost any of the arsenals might manufacture some small part, in limited quantities, but those three are the ones which manufacture parts in sufficient quantities to be called ammunition factories.

Senator OLIVER. Do you not manufacture a good deal of small-arms ammunition?

Gen. CROZIER. Yes. I specified artillery ammunition.

Senator OLIVER. At almost all of the arsenals you manufacture small-arms ammunition?

Gen. CROZIER. No; that is made at only one arsenal, the Frankford Arsenal.

Senator OLIVER. The Frankford Arsenal?

Gen. CROZIER. Yes.

Senator JONES. What portion of this do you think would be likely to be used in the Government manufacture of ammunition?

Gen. CROZIER. This article relates to mobile ammunition as distinct from seacoast artillery ammunition, and I would expect to expend in the arsenals about \$3,600,000.

Senator JONES. A year?

Gen. CROZIER. Yes; in this coming year, in the manufacture of this kind of ammunition; and the rest of the appropriation, whether in this bill or in the Army bill, would go to purchase from private manufacturers.

Senator JONES. So that you contemplate using possibly more than half of the cash in the Government manufacture?

Gen. CROZIER. More than half that amount of cash; yes, sir. It might not be specially from this appropriation. That might be from another appropriation for that kind of ammunition.

Senator JONES. Do you contemplate materially enlarging the facilities in the arsenals for the Government manufacture of ammunition?

Gen. CROZIER. I contemplate some enlargement of the facilities for manufacturing this kind of ammunition at the Frankford Arsenal; not very great, but there is carried in the sundry civil bill an item for considerably enlarging the facilities for the manufacture of this kind of ammunition, but placing that enlargement at the Rock Island Arsenal, in the Mississippi River. Also for the seacoast ammunition, which is not included in this particular item, the same bill, the sundry civil bill, carries an appropriation for a considerable enlargement of Government facilities at the Watertown Arsenal.

Senator JONES. About what proportion of ammunition do you think, or does the department think, if you know, the Government itself should manufacture?

Gen. CROZIER. The War Department has taken this attitude on that subject, Senator, that in regard to ammunition and in regard to all other fighting material which is not also a commercial article, and for which therefore the Government is the only customer, the Government itself should manufacture enough to enable it to ascertain what the fair price ought to be, to train its officers to be experts in the subject, to enable it to prescribe qualities and tolerances; and beyond that, that the reliance should be upon private manufactures.

Senator JONES. Take, for instance, powder. What is the attitude of the department as to the proportion of powder that it should itself manufacture?

Gen. CROZIER. That attitude covers powder as well as other materials.

Senator JONES. That is, of course, competitive. Powder is used for other purposes than war.

Gen. CROZIER. Not military powder.

Senator JONES. Oh, it is not?

Gen. CROZIER. No, sir. The powder that is used in cannon and in military small arms is not used for any other purpose. Even that which is used in military rifles is different from the powder that is used in sporting rifles.

Senator JONES. I think that is all I wanted to ask on that.

Senator UNDERWOOD. Is that all you wanted to say on that item?

ADDITIONAL OFFICE SPACE FOR DESIGNING AND DRAFTING WORK IN
WASHINGTON, D. C.

Gen. CROZIER. We were on this item of authorization of expenditures. That is all about that particular thing; but related to that there is another point in connection with this employment of these draftsmen. There is another restriction of law which would prevent our expending money, even although we might have the funds available, for the rental of space here in Washington, unless it is specifically provided for. The new designing work which is being thrown upon the Ordnance Department, calling for a greatly increased number of draftsmen, of course requires a greatly increased space for their accommodation, and it is absolutely impossible to get it in the War Department, or anything like it. There is a space famine in the War Department, and I can not get a square foot added to what I have been having for some years past, and my designing work is now being very disadvantageously held back. That is, I am not producing designs for these new kinds of artillery that we have been hearing about in connection with the European War, because I can not employ the draftsmen, for one thing, and among other things, I can not get the space to put them in on account of this restriction. Therefore, I would ask that there be added another provision to this that not to exceed \$10,000 of the amount appropriated by this act should be used for the payment of rent of suitable space for the use of such force of skilled draftsmen, and other force, as may be required in the production of the materials provided for in this and other acts, in Washington.

Senator UNDERWOOD. Will you prepare that amendment and furnish it to the committee, designating the place where it can go into the bill, and giving the exact language you want?

Gen. CROZIER. Yes.

Senator OLIVER. How much space will be required?

Gen. CROZIER. About 8,000 square feet.

Senator OLIVER. Is not \$10,000 a good deal for that?

Gen. CROZIER. It does seem so, but we have scoured the city in the vicinity of the War Department and we do not seem to be able to get what is needed for any less sum. Of course I would not spend all that if I could get it for any less. This was put before the House committee. I do not think there was any hostility to it in the House committee, but it was confused with an item of legislation which empowers, I think, the Secretary of War and the Secretary of the Navy and the Secretary of State as a committee, to parcel out space in the War Department Building differently from the way in which it is now parceled out by statute; but you see that would not help us any, because the space is not there to be parceled out, and I can not get it, and that item of legislation does not carry any additional authorization to get space.

Senator OLIVER. As I remember that legislation, it was designed to take away part of the space that the War Department had, and give it to the Navy Department, was it not?

Gen. CROZIER. I hardly think so, Senator.

Senator OLIVER. I do not know whether that passed or not.

Gen. CROZIER. It failed.

Senator TOWNSEND. But that was the idea. They were trying to take away something that you had?

Senator OLIVER. I think that was the idea with some of the other bureaus of the War Department.

Gen. CROZIER. Yes. I should like to get one large room for this drafting. There has to be special light for that work.

Senator OLIVER. It will be hard to get 8,000 feet of floor space in that way.

Gen. CROZIER. Yes. That would be 200 feet by 40 feet.

Senator JONES. What is that large building being constructed now just a little way west of the War Department.

Gen. CROZIER. That is the Department of the Interior building. We could not get anything there.

Senator JONES. Will that space be all occupied in that building from the beginning?

Gen. CROZIER. That I do not know. Of course if it should not be, that would be very advantageous. That would be a first rate situation for us.

Senator JONES. The building of the Department of Commerce is on Pennsylvania Avenue.

Senator OLIVER. Yes; I understood that that other building was for the Department of Commerce. Is it intended to move all of that department down there?

Senator UNDERWOOD. No; that is for some of the bureaus of the Department of the Interior, the Geological Survey, and others, which are now occupying rented buildings.

Senator JONES. It seems to me it would be well to look into that and see if there might not be some space there for this purpose. That would be very nicely located.

Gen. CROZIER. Yes; and if I could get that it would be certain that I would not spend this for rent, because this amount would have to be taken from my appropriation, of course. I would not do that if I could get space from the Interior Department. You see, this does not increase the appropriation.

Senator JONES. Yes, I understand; but you will have to spend that much money.

Gen. CROZIER. Yes; it comes out of the Government's pocket.

Senator JONES. If you could get suitable quarters in that building, it would be very good, and it seems to me it would be well for you to look after it and see if you can not do it.

Gen. CROZIER. Yes; we will watch that very closely, because I am very much afraid that even with this expenditure of funds we can not get as good a place as that would be.

Senator TOWNSEND. It seems to me when you are drafting that amendment that the Senator from Alabama suggested you should prepare, it would be well if you made it a part of that other amendment.

Gen. CROZIER. Yes.

Senator TOWNSEND. You must bear in mind that that is to be put in as a new paragraph. You are not drafting that as an amendment of any paragraph.

Gen. CROZIER. No.

Senator TOWNSEND. It is not a proviso, but it is a new paragraph in the bill.

Gen. CROZIER. Yes.

Senator TOWNSEND. I think you should have made direct reference to the fact that there are other appropriations for this purpose made to be used outside of Washington, and this is meant to be applied to payment of services in Washington.

Gen. CROZIER. Yes.

Senator TOWNSEND. The Senator from Alabama asked you to draft an amendment and indicate where it ought to go in the bill, and prepare just the language that ought to go in.

Senator UNDERWOOD. Will you send that amendment to us separately?

Gen. CROZIER. Yes, sir.

Senator UNDERWOOD. We may act on this bill before the hearings are over.

Gen. CROZIER. I will do that before I leave the committee room to-day.

Senator UNDERWOOD. What is the next item?

ALTERATION AND MAINTENANCE OF THE MOBILE ARTILLERY, ETC.

Gen. CROZIER. The next item is on page 5, line 12, "For alteration and maintenance of the mobile artillery, including the purchase and manufacture of machinery, tools, and materials necessary for the work and the expenses of the mechanics engaged thereon, \$100,000."

The bill now carries \$100,000. That is for the upkeep of the field artillery which is in the service. It is continually needing repairs, alterations, and so forth. The term "alteration" refers not only to that which may be in the service, but to that which may be in store; when we devise an improvement to existing artillery, which happens every once in a while. Of course, the amount of field artillery which is now being brought into the service of the United States is far greater than that which I had in contemplation when I had my hearings, even before the House Committee, and there will be possibly something like campaigning with it, and the wastage will be greater, the service will be harder, and the amount for repairs will be greater than in ordinary garrison conditions which we are always having to meet. I do not know whether in connection with this bill you choose to take up any expenditures connected with the mobilization of the National Guard which is going on, for instance, but if you do, then this item would have to be increased five or six times.

Senator UNDERWOOD. Under peace conditions you would not need anything more in that item?

Gen. CROZIER. No; not under peace conditions.

Senator UNDERWOOD. Go on to the next item, then.

PURCHASE, MANUFACTURE, AND TEST OF AMMUNITION—AGAIN.

Gen. CROZIER. On that same page, line 16, there commences an item of appropriation, "For purchase, manufacture, and test of ammunition, subcaliber guns, and other accessories for mountain, field, and siege artillery practice," etc. That is target practice. The estimate on which that appropriation was based was made on the supposition that there would be added in the first instance this year two

Artillery Regiments to the existing force. The estimates had been made last autumn. Now, as the national defense bill has been enacted into law, that addition is increased to three regiments. There will be three Artillery Regiments in the first increase. Therefore, to provide for the target practice, that appropriation of \$400,000 should be increased to \$480,000, contemplating only the peace-time situation, in accordance with what has already become law.

Senator JONES. It seems that the estimate was \$862,500

Gen. CROZIER. That included the continental army of the War Department of last fall.

Senator JONES. So that you think \$480,000 will adequately take care of what is necessary along that line?

Gen. CROZIER. Yes, for the Regular Army. Of course, the practice of militia now called into the service of the United States will be additional; but that will have to be taken care of by some kind of emergency appropriation, I take it.

There is only one other subject to which I would refer.

Senator TOWNSEND. Then I understand that all these other reductions in the bill made by the House are satisfactory to you.

Gen. CROZIER. We can get along with them under the conditions that we have agreed upon in the course of the hearing. Most of the others refer to seacoast artillery.

ADDITIONAL OFFICE SPACE FOR DESIGNING AND DRAFTING WORK AT
WASHINGTON, D. C.—AGAIN.

Senator OLIVER. Here on page 6, on the slip pasted at the top of the page, is an item of rent, \$5,000. That is "for rent of a suitable building or rooms for the use of such force of mechanical draftsmen and other labor, not clerical, as may be required in the production of the material appropriated for in this and other acts."

Gen. CROZIER. That had to be increased to \$10,000, for two reasons. For one thing, we found that the space was more expensive than we had expected it to be, and then between last autumn when that was first submitted and the present time, the amount of designing work has been greatly increased. Among other things, there is that turret that I spoke about, and there are several other items as well, principally in the line of heavy artillery. To give you an idea, Senator, of the amount of work involved in this designing, the drafting work for that turret would take one man 30 years to perform. Of course, we will not do it that way. We will take 30 men and try to do it in one year.

Senator OLIVER. This does not state that it is to be in Washington, either. I suppose that should be inserted?

Senator UNDERWOOD. That is the same provision that you were talking about a while ago?

Gen. CROZIER. Yes.

Senator OLIVER. This is the same as you suggested to us a while ago, for which you were asking \$10,000?

Gen. CROZIER. Yes; it is the same, except that the amount is now \$10,000.

Senator UNDERWOOD. You will perfect the language for that?

Gen. CROZIER. Yes.

Senator UNDERWOOD. What is the next item?

Gen. CROZIER. On the last page of the bill, page 14, there are three restrictions, in sections 3, 4, and 5.

PRICE OF POWDER OTHER THAN FOR SMALL ARMS.

The first is "That appropriations in this act shall not be expended for powder other than for small-arms powder at a price in excess of 53 cents a pound." That is a provision which has been in the act for several years past, and under which, when we have been allowed to purchase powder at all, we have been allowed to purchase it at 53 cents a pound.

Senator JONES. None less?

Gen. CROZIER. We have not been able to purchase any for less.

Senator JONES. You have just purchased it for that limit?

Gen. CROZIER. Yes, and that is less than it ever was before. Ten years ago we were paying 80 cents a pound for it. But we make it ourselves for even a less price than this.

The price of all material entering into the manufacture of powder has very considerably gone up, and although I am rather of the opinion that we can still get it for 53 cents a pound, it will be because of the special situation in which private manufacturing facilities have been largely increased, and foreign orders are likely to fall off very rapidly. Therefore I think we will be able to get it for this price. But under normal conditions, and without a plant which has already been paid for and crossed off the books because of its utilization in filling foreign orders, I do not believe we could get it for 53 cents. I just mention that. I am not calling for raising that limit, because my opinion is that such powder that we have to have we can get within the limit. The committee, however, can follow its own judgment in relation to the facts.

LIMITATION OF PRICE TO BE PAID PRIVATE MANUFACTURERS.

Section 4 provides, in effect, that I can not procure anything out of the funds appropriated in this act at a price more than 25 per cent greater than the cost of manufacturing in the Government establishments. I would like to ask how I should get the material in case I should not be able to manufacture it and should not be able to purchase for such price?

Senator TOWNSEND. Do you know how much it costs to do that?

Gen. CROZIER. I know pretty well how much it costs us to make some things that we make, especially when we make them in the largest quantities. Of course, new things have to have their cost estimated. Small-arms ammunition, for instance, we have made in large quantities for years. It is not appropriated for in this bill, however. The Infantry rifle, which is made in large quantities, and pistols, which we make in considerable quantities, and such items as that, I can tell about; and field artillery material.

Senator TOWNSEND. When you figure on an item like this, do you figure on all elements of the cost that go into private manufacture?

Gen. CROZIER. I put in all those which the private manufacturer has to meet which the Government also has to meet, but I do not put in those things which the private manufacturer has to count

but which the Government does not have to count at all. For instance, selling expense and advertising; I do not put those in; but I do put in interest on the cost of the plant, depreciation, and fire loss, to compare with the insurance; the superintendence which is given by officers whose pay comes out of another appropriation; every expenditure which the Government has to meet. I put in an allowance for the salary of the Secretary of War.

Senator TOWNSEND. Under that provision could you determine exactly what 25 per cent in excess of your cost was?

Gen. CROZIER. I would not be justified in saying I could determine it exactly, because in manufacturing operations there is nothing more elusive than cost.

Senator OLIVER. And some of the materials which they manufacture you have no way of getting at the cost of, because the Government does not manufacture any of them?

Gen. CROZIER. Yes, of course.

Senator OLIVER. This would limit you on everything?

Gen. CROZIER. In the supply table there is material that the Government is not fitted to make at all. For instance, we furnish blankets for the Artillery, and saddles and harness, and the Government does not make blankets. Then there are the cartridge belts, which are specially woven on special looms. The Government does not make them at all. In this bill there are some finished products which we do not make. For instance, some of the high explosives we do not make at all. We do not make trinitrotoluol. We do not at the present time make picric acid, which is an explosive.

Senator JONES. Would you be able to make any estimate of the cost of the manufacture of those things?

Gen. CROZIER. It would be very difficult for me to do so, Senator. I may add that it is not perfectly clear whether the cost of manufacturing such material by the Government mentioned here is intended to include these overheads which the Government is subject to. I would be inclined to take it that it is.

Senator UNDERWOOD. What interest do you charge up against your plant?

Gen. CROZIER. I charge 3 per cent, because the Government can borrow money at 3 per cent. Of course that is a legitimate advantage, due to the Government's greater credit, which we have over the private manufacturer.

Senator UNDERWOOD. Those are actual costs, and there is hardly a comparison.

Gen. CROZIER. That is just as much a legitimate advantage as the advantage which a large manufacturer with large capital would have over a small manufacturer.

Another advantage is in the matter of insurance. The Government does not insure; therefore, the Government is subject to fire losses only. But in ordinary business life I fancy that the average fire losses are not much more than half the insurance cost, and the cost of the insurance has to include not only the payment of losses but the maintenance of the offices of insurance companies and their force. That is another legitimate advantage. Some concerns might be large enough to carry their own insurance, and they would stand the losses the same as the Government does.

Senator TOWNSEND. You can not purchase in excess of 25 per cent of what it costs you. You have got to make some kind of comparison somewhere, to find out what that 25 per cent is.

Gen. CROZIER. Yes. It is going to be exceedingly difficult in regard to a good many things. In regard to a few, I can do it.

Senator TOWNSEND. What would be your suggestion about relief in this matter?

Gen. CROZIER. Senator, I think that the War Department ought to be free from these restrictions, altogether.

Senator JONES. Has that provision been in the bill before?

Gen. CROZIER. No, sir.

Senator JONES. This is a new provision?

Gen. CROZIER. Oh, there has been a provision in the bill for a few years only, which was even more stringent than this, which was to the effect that not more than 10 per cent of the amounts appropriated could be expended at any price for material to be procured from private manufacturers, except such things as the Government could not make itself.

Senator JONES. Of course that would not be hard to work out.

Gen. CROZIER. No, that would not be hard to work out, and although more stringent in its terms, under these conditions that confront us now it would not be any more stringent, because these bills call for amounts far beyond the manufacturing capacity of the Government. I would, therefore, be free from that provision, notwithstanding its drastic form. But here, I am not allowed to expend anything at all without making an estimate.

Senator TOWNSEND. How would you buy things if you were given a free hand in the matter?

Gen. CROZIER. I would operate my arsenals, first, to their efficient and proper capacity, and beyond that I would resort to competitive bidding. That is what we have always done heretofore. Then I would try to use the capacity of my arsenals in such a way as to, in a particular case, prevent the Government from being extortionately charged. In other words, I would try to preserve some kind of reserve capacity in the arsenals so that a particular order could be placed there if it could not be placed elsewhere advantageously. The condition relative to competitive bidding has very considerably improved since the European war commenced, because there are now many more factories in the country, and with much larger capacity, for the manufacture of war material than existed before, so that I think that the opportunities for competition are much better than they have been heretofore.

Senator TOWNSEND. The committee in the House had in mind that instance where they submitted certain work to competitive bids, where the lowest bidder did not have any preference over the fellow that bid the highest.

Gen. CROZIER. I think it has been charged by the armor plate manufacturers that in that case they did not compete, because the low bidder did not get any larger orders from his low bids.

Senator TOWNSEND. He had to divide it with the others?

Gen. CROZIER. Yes. These restrictions and those in regard to the employment of draftsmen in the District of Columbia, and the rental of space, hamper us very much, because we simply are not

clever enough to foresee all the ways in which they will interfere with our carrying on our business, and to present them to you for relief in time. With the best we can do, there will be bound to be some instances that we will omit, and there will be ways in which we shall be restricted, that we could not foresee.

Senator TOWNSEND. About what proportion of the things you do make—or that you can make, rather—will you make, of those that are used by the department; what proportion of the total amount required by the department? In other words, how much powder, on a peace basis of the Army as newly organized, could you furnish and how much would you have to buy?

Gen. CROZIER. I can give you a general answer which will include powder and all the other things, and perhaps it will be more comprehensive than the one with reference to powder alone.

Senator TOWNSEND. I just mentioned powder so as to make my question clear.

Gen. CROZIER. Of all the fighting material which is appropriated for in the Army bill, the fortifications bill, and the sundry civil bill as they are now before Congress, and in the stages in which they are now, irrespective of the way in which the figures may be altered hereafter, of all that material the total appropriations amount to something like \$50,000,000, as related to the Ordnance Department. Of that \$50,000,000 I would expect to expend about two-fifths in the arsenals, in Government manufacture, and about three-fifths in private establishments. About twenty and thirty millions are the proportions. Those figures include automatic machine guns, field artillery, sea coast artillery, ammunition for both kinds of artillery, rifles, pistols, personal and horse equipment, such as haversacks and canteens and saddles and bridles—all that material which is furnished by the Ordnance Department, of which those are the most common examples.

Senator JONES. What steps would you take, or would it be necessary for you to take, to comply with the last provision of this section here; that is, if you wanted to buy something that you do not manufacture and never have manufactured, what would you have to do first, under this section? What step would you take to ascertain the cost of manufacture? What agency have you got to ascertain it?

Gen. CROZIER. I have not any competent agency, Senator, in the case of the things that I have not manufactured myself. My officers are reasonably expert in the cost of things that we have produced in our own arsenals, but they have no claim to be experts in the cost of things that we do not produce at all. They are not as expert along those lines as civilian accountants that we might get hold of would be.

Senator JONES. Would it not almost be necessary for you to employ an additional force of men specially acquainted with the manufacture along these lines?

Gen. CROZIER. Yes, sir; in order to properly carry out that intention, I would have to. I would not do it in regard to things which we manufacture ourselves.

Senator JONES. No; I understand that. It looks to me like you would have to have a very great increase in force of men of different experiences along different lines.

OPERATION OF GOVERNMENT ARSENAL.

Gen. CROZIER. Now, there is another restriction in section 5, "That expenditures for carrying out the provisions of this act shall not be made in such manner as to prevent the operation of Government arsenals at the most economical rate of production, except when a special exigency requires the operation of a portion of an arsenal's equipment at a different rate." That involves the idea that the most economical operation would probably be at a two-shift rate, and the exception contemplates a necessity for running an arsenal, or a portion of it, at a three-shift rate, which would not be the most economical. But I do not know that I can say that operation at a two-shift rate would be more economical in general than at one shift or not. The direct cost of production would be higher, because labor and superintendence are less efficient on the two-shift basis than they are on the one-shift basis. We are not officered for a two-shift basis, for one thing. The saving would come in that the constantly running overheads, such as interest and depreciation, and some kinds of superintendence, would be chargeable to a larger output.

Senator JONES. What effect would that provision have on the present operation of Government arsenals?

Gen. CROZIER. I would feel it necessary to operate them all probably on a two-shift basis. They are operating partially on a two-shift basis now, and on a three-shift basis only at exceptional choke points, as we call them.

Senator JONES. Do you not try now to operate them as economically as possible?

Gen. CROZIER. I have not made an effort to discriminate as to the economy of operation between a two-shift basis and a one-shift basis, with reference to the rate of operation. I much prefer to operate them at only a one-shift basis, and I think that is a better policy for the Government.

Senator JONES. Is it, from your standpoint, as economical as the other?

Gen. CROZIER. My guess would be that the two-shift basis would be a little more economical; that is to say, that the lower efficiency of work, of labor and superintendence, would be a little more than compensated for by the spreading of the overhead charges over a larger production.

Senator OLIVER. You mean two eight-hour shifts?

Gen. CROZIER. Two eight-hour shifts; yes.

Senator JONES. Why do you not operate them that way now?

Gen. CROZIER. For one reason, I realize that the reason for operating them at all is in preparation for war. If I operate them at a one-shift basis, and then am directed to and do draw on private manufacturers for surplus things, I have a two-shift expansibility in the arsenals, and I have some private manufacturers who are capable of doing our work, besides; whereas if I were to operate at a three-shift basis, I would use up all the expansibility of the arsenals, and have none in time of necessity.

Senator JONES. Do you not think it is important to take that into account?

Gen. CROZIER. I think it highly important.

Senator JONES. Would not that offset whatever economy would come?

Gen. CROZIER. I think it would much more than offset it, because I think the economy of operating at two shifts, provided that it exists, which I suspect but can not prove, would be very small.

Senator JONES. Do you think this economy applies only to the financial aspect of it?

Gen. CROZIER. I have thought that was what it was intended to be applied to. I would be glad to have a ruling that it does not, and that it applies to general efficiency.

Senator TOWNSEND. When you speak about having efficient men and a two-shift basis, do you mean you would get poorer material as the result of the two-shift basis?

Gen. CROZIER. Of course, the excellence of men, since we would have to employ approximately twice the number, would fall a little on the average, as it always does when you have to increase your numbers. I think of more importance than that is that in night work men do not work well.

Senator OLIVER. It is hard, night work.

Gen. CROZIER. It is difficult to make men take their proper rest in the daytime, so that they will be fresh in the night, and it is difficult to secure such a surplus of good superintendents that there will be enough of first-class quality to extend over two shifts.

Senator JONES. Then you are in danger, in reality, of getting a poorer product?

Gen. CROZIER. Yes; I think all manufacturers would say that.

Senator JONES. That is not economy.

Gen. CROZIER. No, sir; that is not economy.

Senator TOWNSEND. The House did not want you to be too economical about this, anyway, did they?

Gen. CROZIER. They say "economy" in that section.

Senator TOWNSEND. What do you think they meant that to apply to [indicating paragraph in bill]?

TIME STUDY AND PREMIUM PAYMENT SYSTEM.

Gen. CROZIER. That prohibits using time studies and premium payments, which I think is a very disastrous proviso. We have had a good deal of experience now with time study and premium payments. We have been operating under the time-study and premium-payment system at the Watertown Arsenal, where we have done the most of it, for five years. Under it the output has very considerably increased, the cost of labor has very considerably decreased, and the pay of the workmen has very considerably increased.

Senator TOWNSEND. What do you mean by that?

Gen. CROZIER. The amounts paid employees have very considerably increased.

Senator TOWNSEND. Oh, yes.

Gen. CROZIER. The Watertown Arsenal employs about 600 workmen, and I get from the arsenal a monthly report of the amount of work which is done under the premium system by each individual workman who works under that system, and the increased earnings of these men for the time when they are working on premium-paid

jobs averages about 27 per cent of their regular day pay, and has done so for years. The premium earned by the men, if it were spread out over all of them, who work on premium jobs, at all, would increase their pay in accordance with the recent records, on an average by \$10 a month.

Senator TOWNSEND. You say the men do not work on premium jobs all the time?

Gen. CROZIER. Because we are not able to make time studies of all the jobs, as we would like to; but we make all the premium jobs we can. That 27 per cent applies to the time they work on premium jobs, and if that were spread over all the time when they were working on premium jobs, it would amount to 27 per cent. That is, 27 per cent over their regular wages, and the wages are fixed in accordance with the wages of the vicinity for work of like character; and those wages are now ascertained for us by the Department of Labor. We have followed that practice within the last year, of asking the Department of Labor to send an agent up there to determine the wages, so as to have an outside agency make the comparison. It has not resulted in any increase of any significance whatever in the wages we have been paying ourselves, at the places where we have been practicing this time study and premium-payment system.

Senator OLIVER. Have you discovered any discontent, among the workmen themselves, with this system?

Gen. CROZIER. There is evidence of discontent in the form of petitions, although none very recent, sent in, numerously signed, from workmen.

Senator OLIVER. From the men themselves?

Gen. CROZIER. From the men themselves; yes, sir. There is also evidence the other way, in the way of strongly worded letters of protest against the abolition of this time study and premium payment, from some of the men themselves. The evidence in the establishment of cheerfulness and cooperation and industry and satisfaction with the method is very strong indeed. The relations there have never been more harmonious, but then there is the evidence of these petitions.

Senator TOWNSEND. What do they ask for in these petitions; what is their grievance?

Gen. CROZIER. One of the most common things set forth in the petitions is that one workman will be given a premium job and have a chance to earn a premium, and another workman in the same shop with claim to be equally meritorious, and perhaps is equally meritorious, will not be given a premium job and will not have a chance to earn a premium. The answer to that is that while that is true to a certain extent, we make it true to the least possible extent, and as the method continues and as we become more accustomed to it we are continually increasing the percentage of employment on premium jobs.

Another part of the answer is that that complaint is not a complaint of the premium system, but a complaint of there not being enough of it. The man who does not get a premium job and does not have an opportunity to get a premium still gets the full pay of his grade in comparison with the wages of the vicinity, and a man who gets a premium job gets more. Now, the complaint as to the man who does not get the opportunity to earn the premium is the complaint

that this premium system is not carried far enough. We are extending it as much as we can.

Senator TOWNSEND. Would it be possible to make it universal?

Gen. CROZIER. I doubt if it ever reaches that point, although we have a very considerably increased percentage of premium work since we started the system.

Senator JONES. When you start the premium system work, do you start all the men in that kind of work, on premium work, or are you able to start only a part of the men?

Gen. CROZIER. All the men doing the same kind of a job we start on premium work. The premium work requires for its inception that what is called a time study shall be made of a job. That is to say, a man comes and watches a good workman employed on a job, with the knowledge of that workman—they both understand what the process is—and times all of his different operations, and makes such suggestions as to where they could be done with better facility, where there could be an improvement made; where he could do something in the way of bringing up another piece, for instance, while the piece in the machine is moving, instead of doing that while the machine is stopped, and so forth. The time is then arrived at in which the job could be reasonably expected to be performed without undue fatigue, in continuous operation. Then to that is added, in our practice in the Watertown Arsenal, two-thirds; it is increased by two-thirds, and a man is told that for any time he saves within that time thus increased he will get a premium, which will be so adjusted that if he does the work in this time ascertained to be the time in which it could be reasonably expected to be done, the premium will amount to one-third of his pay, and he can do it in still less if he wants to, and he often does.

Senator JONES. When your time experiments show that the work can be done in 60 minutes, you fix the reasonable time for doing that at what?

Gen. CROZIER. If we find that the job can be done, say, in 45 minutes, we add to that an allowance based upon experience, for fatigue and interruptions, etc., and get it up to, say, 60 minutes, and we often add a greater allowance than that. We will take that 60 minutes as the time in which it could be reasonably performed, and we will add to that two-thirds, making 100 minutes, and we will say to the man, "For all the time within 100 minutes that you save, you will receive a premium, and that premium will be so adjusted that if you do that job in 60 minutes the premium will amount to one-third of your pay, and you can do it in less time if you want to." It is on that system that these men doing premium jobs earn from 25 to 27 per cent more than their regular wages.

Senator TOWNSEND. What effect does that have upon the hours of labor?

Gen. CROZIER. We work eight hours in accordance with the statute, irrespective of that system, and we do not exceed it.

Senator UNDERWOOD. You merely get a larger output from the men who do premium jobs?

Gen. CROZIER. Yes; a larger output, and an output which is over twice as large on the average as we got, and as we continue to get on the jobs on which the men do not get premiums.

Senator TOWNSEND. Have you caused any study or investigation to be made as to the effect upon the physical condition of the laborer himself of this speeding-up process?

Gen. CROZIER. I have examined that subject carefully and have employed experts who have had a great deal of experience in that and, based upon our experience, this allowance for fatigue which I mentioned a moment ago is fixed. In addition to that I have in several instances made an analysis of characteristic jobs at the Watertown Arsenal to see whether there is any possibility of the men being overworked. For instance, a job will be done on a machine, in a lathe, we will say. That job is divided into two general parts, called, with reference to the time that they require, the machine time and the handling time. The handling time is the time when a man has to be doing something with his hands; he has to be putting a piece of work in his machine and setting it up to be turning on the feed screw of his cutting tool or something of that kind. The machine time is the time when the workman stands in as comfortable an attitude as he cares to take and watches the machine work. In the ordinary machine it is rarely that the handling time amounts to as much as half of the total time. So that for more than half his time the man is usually watching his machine do the work, and that has been the case in the instances which I have examined, and I have examined those instances usually with reference to some complaint.

Senator TOWNSEND. You started to tell us, and you did mention the one complaint, that there were not enough premium jobs to go round. What other complaints do the laboring men set up in their petitions or by letter or otherwise?

Gen. CROZIER. Another very common complaint is that the premium jobs or opportunities to earn premiums are given to low-priced men; that the object of this system is to procure work which is practically the works of high-class tradesmen, such as machinists, to be done by a much lower class of men, who can do one thing only, and are therefore included under the term of "machine operators" as distinct from machinists; and that therefore this works a discrimination against the higher class men in favor of the lower class men. At the Watertown Arsenal I have had that specially examined into and have found that the records show that the proportion of earnings by the high-class men at that arsenal is considerably higher than the proportion of earnings by the low-class man. In other words, the facts are the exact contrary of those alleged in the complaint.

Now, with reference to another feature of that complaint, and this is a feature which is borne down on pretty strongly by the labor unions, namely, that there is a tendency to eliminate the machinist's trade in favor of the machine operator, who does only one thing and is not an all-round man, my answer to that is that in general it has nothing to do with this time study and premium payment system, or with the subject of scientific management, of which that system forms a part, but it is an accompaniment of all industry. It has been done since the beginning of industry and is being done now all the time. It receives an illustration in our work in the manufacture of the infantryman's rifle, for instance. In the early days a rifle was manufactured by a gunmaker who made all parts of the rifle himself. It is now manufactured by a large number of men working on machines which are to a very considerable extent automatic, each man making some part, or even doing only some opera-

tion on some part. Some of those parts require a hundred operations, and man may do only one of them.

Senator OLIVER. Mr. Ford has carried that pretty nearly to perfection in his establishment, has he not?

Gen. CROZIER. Yes.

Senator OLIVER. Having one man do one thing?

Gen. CROZIER. And another man do another. That accompanies all industry. By means of that, in the rifle industry we are able to make a far better rifle than under the old system that was in vogue years ago, and at a far lower price.

Senator OLIVER. And under the old system of manufacture no other rifle would ever be like that rifle.

Gen. CROZIER. And all the parts are now interchangeable. Another illustration, which is a very familiar one, and you all are probably, at least, as familiar with it as I am, is that of the shoemaker. In the olden time a shoemaker used to make the whole shoe. The result of the change in method of making shoes is that they are much cheaper, and the result is that people can wear shoes now who never could think of wearing shoes in the old days. So much for that complaint.

Senator TOWNSEND. Were there any other complaints?

Gen. CROZIER. There was a complaint which has been made on behalf of our workmen by outside workmen, but which has not been made by the workmen themselves, in regard to speeding up and overwork. There is no allegation of overwork by our workmen. No man has ever said or admitted that he was overworked. So that I suspect I should not include that complaint in my answer to your question, since it is not made at our establishments.

Senator JONES. About how many protests have you had against this system from the Watertown Arsenal laborers?

Gen. CROZIER. I think three or four, probably. Some of them are very numerously signed. But, with regard to that, my conviction is that those signatures were procured at the instance of labor organizations outside of the arsenal.

Senator JONES. How many employees have you there?

Gen. CROZIER. About 600.

Senator JONES. About what proportion of them have signed some of these petitions?

Gen. CROZIER. In some cases, over one-half. One workman wrote me in regard to one of these numerously-signed petitions that if the signatures were removed of men who had signed the petition under some kind of compulsion, and of men who had signed without knowing what they were signing, there would be nobody left but the framers of the petition. That came from a workman. In that particular case, the method followed of obtaining a good many signatures was to circulate a blank piece of paper, and for the men to sign that, and then the signatures were copied off onto the petition. A large number of the signatures were in the same handwriting on the petition. I do not think that was done with any fraudulent intent. I think that the men who signed all knew that they were signing some form of protest against the system, and the man who did the copying did not realize that that was not the way to present signatures. I do not think there was any intentional bad faith in it.

Senator JONES. Can you, without too much trouble, put in your statement copies of those petitions, leaving off the signatures?

Gen. CROZIER. Yes, sir. I can furnish you with what perhaps will suit you better, a marked copy of a congressional document in which the petitions are printed, and also certain other matters in connection with the petitions, for instance, my answers to them. If there is any way of getting hold of Senate Document No. 800, of the last Congress, I could in a short time allude to several others, I think, and allude to the answers.

Senator JONES. If it has already been printed, that is enough.

Senator OLIVER. I received a petition from the employees of the Frankford Arsenal at Philadelphia, which it seems to me included all of the employees, very nearly, protesting against this proposed legislation.

Gen. CROZIER. Yes.

Senator OLIVER. Do you recollect that?

Gen. CROZIER. Yes.

Senator OLIVER. As the result of that the Committee on Military Affairs of the Senate struck it out of the bill, but it was afterwards restored on the floor.

Gen. CROZIER. Yes. Now, with reference to that, Senator, I think I ought to give you the reason why you have not been ever since receiving vigorous protests along the same line since that legislation was put back in the bill on the floor.

Senator OLIVER. Yes.

Gen. CROZIER. The reason is this: The prohibition that was put on the Army bill last year was in very similar language to this, and prohibited the payment of premiums in addition to the regular wages.

Senator JONES. Where is that, here?

Gen. CROZIER. The language is as follows:

Nor shall any part of the appropriations made in this act be available to pay any premium or bonus or cash reward to any employee in addition to his regular wages.

I secured a ruling from the comptroller that piecework rates were different from premiums, and that prohibitions was not included of the employment of pieceworkers; so that, as the work at the Frankford Arsenal is largely repetition work, and lends itself to piecework, I changed the premiums to piecework. I think I ought to explain to the committee now that in my opinion there is no essential difference between piecework and premium work, in its stimulating effect. There are some differences in the conditions under which the two kinds of payments can be made, but it makes little difference whether the stimulus is in the form of piecework rates or premium work rates.

The difference comes in this, however, that the premium work rates have special application to work that is not in the nature of repetition work, of which there will be very few pieces, and perhaps only one, done, whereas the piecework rate applies largely to repetition work where large numbers of the same article are turned out. So that, although the prohibition of premium rates was not very effective at the Frankford Arsenal where there is repetition work, it would be very effective at the Watertown Arsenal, where we make gun carriages and there is very little repetition work.

Senator UNDERWOOD. Is there anything else you want to bring to the attention of the committee, General?

Senator TOWNSEND. Have you figured, General, how much saving per year is made by this premium and time-study business at Watertown?

Gen. CROZIER. I had made up there some careful observations in regard to several jobs of work upon one occasion, which was done under the premium-payment system, after time studies and under the regular day-wage system, and it was found on those jobs that the time occupied under the regular day-wage system averaged 2.7 times that in which the same jobs were done under the premium rate. That would make the labor cost, you see, very considerably greater.

Senator TOWNSEND. I did not understand that matter of 2.7. What was that?

Gen. CROZIER. A man would take, to do a given job of work, 2.7 times as long under a regular day-wage system as he would under the premium-rate system; and that is not a singular experience at all. It is very common. I have had made at the Watertown Arsenal a curve of the rate of production of pig iron, per employee, commencing at about the time we put in the premium system, and as the premium system continued the curve of production regularly rose until the production ended up with over three times the amount it had been to start with, in the same length of time.

Senator UNDERWOOD. Was that in the manufacture of pig iron, you say?

Gen. CROZIER. That was in the manufacture of pig-iron castings produced per employee, not in money value but in pounds produced.

Senator UNDERWOOD. That was making castings, not in the production of pig iron?

Gen. CROZIER. No; it was iron casting in the foundry, and not the production of pig. We do not do that.

Senator JONES. Is there any plant where this prohibition that was put in the military bill has really gone into effect affecting any considerable number of employees?

Gen. CROZIER. No; not to any extent; for the reason that at the Watertown Arsenal, where the prohibition of the payment of premiums would have been serious, the work is practically all done from appropriations made in the fortifications bill, and last year this legislation was not put on the fortifications bill. This is the first time it has appeared on the fortifications bill.

Senator JONES. So that there is no complaint where that prohibition has affected any considerable number of employees?

Gen. CROZIER. No, sir; not so far; but there will be if this remains on this bill.

Senator JONES. Yes; I understand.

Gen. CROZIER. Now, I think I will make another statement with respect to that. With reference to this payment on the piecework system and on the premium system these items of legislation have been attached to these bills, and under them the ruling of the comptroller will protect the disbursing officer; but there is a bill pending with a favorable recommendation before the House of Representatives covering the same subject, in which it is made a criminal offense to do the things which are prohibited here, and if that bill should become a law I should feel very indisposed to direct any officer to make even any payments on the piecework system, because, when it

becomes not a matter in which he can not be protected by a ruling of the comptroller, but a matter of criminal prosecution, he would be, I think, treading a very narrow line in distinguishing in that way between piecework rates and premium rates.

Senator JONES. You have not had any petition from anybody who has been affected by that prohibition to have it done away with, have you?

Gen. CROZIER. Yes, sir.

Senator JONES. From where?

Gen. CROZIER. Individual workmen at the Watertown Arsenal have written letters protesting against this legislation.

Senator JONES. Since it was passed?

Gen. CROZIER. Yes; although it did not affect them, because these workmen were at the Watertown Arsenal, but they saw the threat of it, and they were aware of the bill I have just mentioned to you, and they were aware of the intention to submit these items of legislation as amendments to the appropriation bills.

Senator TOWNSEND. Were those labor-union men? Did they belong to the unions, or were they not members?

Gen. CROZIER. I think not, Senator, although that is something in regard to which we never inquire.

Senator TOWNSEND. I did not know but what you might know.

Gen. CROZIER. We make no discrimination against the unions.

Senator TOWNSEND. I know you do not, but I was wondering whether any members of the Federation of Labor had felt that this was not a fair thing, and had so expressed themselves to you.

Gen. CROZIER. No employees that I know to be members of the Federation of Labor have so expressed themselves to me.

Senator TOWNSEND. Do you know of any influence anywhere that is working against this efficiency plan, except organized labor?

Gen. CROZIER. No, sir. There was a man who took an interest in the subject, who claims to be an expert along this line, and he criticized some of our methods at the Watertown Arsenal as not properly fulfilling their intent, as not being scientific enough; but he is a very strong advocate of the general method of which this forms a part.

At the request of the Secretary of War, the Federal Industrial Relations Commission created by the act of August, 1912, took up this subject of scientific management. They did not make any investigation of what we were doing at the Watertown Arsenal, themselves, but they employed a committee composed of Prof. Hoxie, of the University of Chicago, a representative of the employer class, Mr. Valentine, and a representative of the labor class, Mr. Frey, to make an investigation of the Watertown Arsenal, and that committee made a report which has not been published officially, but the substance of which has been published in a book by Prof. Hoxie, entitled "Scientific Management and Labor." In this book he did not mention the Watertown Arsenal, but he discussed and to a certain extent criticized the methods of what claims to be scientific management. He said that its performances were not up to its claims. The substance of his objection was that it was not scientific enough; that is to say, it did not efficiently, skillfully do what it claimed to do. But the report stated in effect that scientific management had come

to stay, and that there must be adjustment of its conditions and those of labor.

Senator JONES. Were they unanimous in that conclusion?

Gen. CROZIER. I think they were; yes, sir. I think it was stated that these general conclusions were unanimous. Now, perhaps I am justified in stating one illustrative instance of the kind of criticism which they make, which by some one else was directed particularly at the Watertown Arsenal. Mr. Frey, the labor member of that committee, which I may call the Hoxie committee, presented to the Committee on Labor of the House of Representatives an illustration of what he claimed to be the unscientific nature of this time study to determine the reasonable time in which a piece of work can be done, at the Watertown Arsenal. The illustration he presented was a chart showing the efficiency of a certain workman over a certain period of time. The efficiency was determined by the ratio of the time which he took to perform his assigned job of work to the reasonable time which the time study showed it ought to take. If he had done it in the exact reasonable time his efficiency would be 100 per cent. If he did it in a longer time his efficiency would be less, and if he did it in a shorter time his efficiency would be greater.

In the chart that man's efficiency varied from 20 per cent to over 200 per cent—that is, his efficiency went up and down very violently, you might say—and Mr. Frey from that, assuming that the man was constant and worked just about as well at one time as at another, concluded that these jobs were unscientifically set, and that sometimes performance was possible and sometimes impossible within the time which had been given as the reasonable time. The answer to that is, that upon consulting the records it was found with reference to this man, whom we were able to identify, that when performing the identical job at different times his efficiency varied in the most irregular way—that is to say, it varied by as much as 100 per cent—which completely refutes the supposition that the man was constant and that the irregularities must therefore have been due to unscientific time setting. The curve went up and down in very much the same way, although the fluctuations were not so great; but they were very great. The man was temperamental, and when he thought that he had a good job and he could make a good thing, he hit it pretty hard, and when he did not, he behaved in the reverse manner.

In addition to that, taking the evidence presented by Mr. Frey himself, the average efficiency of the man for this considerable period of time, which his records cover, averaged 120 per cent. That is to say, on the average he was able to do the work in less time than the reasonable time we said it could be done in, by the amount which gave him an average efficiency of 120 per cent instead of 100 per cent, and consequently that man during the time which Mr. Frey's estimate covered, earned an average of 50 per cent over and above his regular day's pay.

Senator JONES. You do not know whether this particular man was opposed to the system or not?

Gen. CROZIER. Yes, he was opposed to the system.

Senator JONES. He was opposed to it?

Gen. CROZIER. Yes; but the conclusion is very difficult to avoid that he is opposed to it on paper only. He is an official of a labor union—that he has brought to our attention himself—and he is a good workman, and he earns these high premiums, and he continues to earn them and has been doing it for years, and there is no evidence that he does not like it except that he says he does not like it. He earns these premiums and takes them cheerfully—seems to like to get them.

Senator UNDERWOOD. Is there anything further, General?

Gen. CROZIER. Well, no, Senator; though I could talk for a week.

Senator UNDERWOOD. The coast-defense proposition does not come within your department or bureau, does it?

Gen. CROZIER. Yes; a large amount of the appropriation which is carried in this bill is for the armament of the coast defenses.

Senator UNDERWOOD. I believe Senator Saulsbury wanted to appear before the committee about the defenses of Delaware Bay.

FORTIFICATION OF DELAWARE BAY.

STATEMENT OF SENATOR WILLARD SAULSBURY, OF DELAWARE.

Senator SAULSBURY. Mr. Chairman, I have just heard that you were considering this fortifications bill, and I was about to prepare an amendment to be presented to your committee. Senator Martin said you were considering it, and I thought I would come in.

Senator UNDERWOOD. I wanted to ask Gen. Crozier about the defenses of Delaware Bay. Senator Saulsbury called to my attention, General, that there were no fortifications on Delaware Bay. Does that come under your jurisdiction?

Gen. CROZIER. I am a member of the board which designs these fortifications, or, at least, prescribes, subject to the Secretary of War, where they should go; where they should be, and what their character should be.

Senator SAULSBURY. What is the reason that there have been no fortifications established for the protection of Delaware Bay?

Gen. CROZIER. The Senator refers to the bay or the river?

Senator SAULSBURY. I know the location, and there is no fortification except at Fort Delaware and Fort Du Pont. Of, course, at the mouth of the river there is a fortification. Perhaps you have seen this letter from the Secretary of War to Senator Chamberlain in regard to this, which I have borrowed from the Committee on Military Affairs. That refers to the fortification of the canal as well as the fortification of Lewes Harbor.

Gen. CROZIER. The Delaware River is closed by fortifications some miles below Wilmington, at Delaware City, but the bay below that has no fortifications. There are none at the mouth of the bay. The board of review, which is the board I spoke of a moment ago, of which I am a member, has considered that subject and has recommended that certain fortifications be established down on the bay, intended to prohibit the occupation of the waters of the bay, at their leisure, by a hostile fleet or any portion of it.

These bills as they are submitted to you never contain a statement of the locations where the armament and the fortifications which the

bill is to provide for are intended to be placed; therefore, there would be nothing in the bill which would indicate whether or not any money appropriated in it was to be expended for the establishment of these fortifications in Delaware Bay. That is usually explained to the committee in hearings, and the War Department generally will adhere to those hearings unless something should occur not anticipated at the time of the hearings; but it is to use its discretion as to where the appropriations are to be expended.

Senator UNDERWOOD. What portion of this bill provides for increasing the fortifications of that kind?

Gen. CROZIER. On page 2; under the Engineer Department, line 4, there is appropriated a sum for the construction of gun and mortar batteries. That is expendible anywhere, at the discretion of the War Department, in the United States. On line 6 of that page there is an item beginning, "for construction of fire control stations and accessories," in connection with fortifications and that appropriation may be expended anywhere, in the discretion of the War Department. Most of these appropriations are expendible without reference to the particular location.

Coming down, on page 3, to the bottom of the page, "Armament of fortifications," that relates to the Ordnance Department, and some of it I have been talking to you about.

Turning over to page 4, line 16, "For purchase, manufacture, and test of sea coast cannon for coast defense," etc., those sums are expendible without reference to location, so far as the act is concerned.

Senator UNDERWOOD. Then the board locates the forts and builds them and equips them out of these general appropriations?

Gen. CROZIER. Yes.

Senator UNDERWOOD. And it has not been customary to make specific appropriations for this purpose?

Gen. CROZIER. No; it has not been; but it has been customary to mention in the hearings where these amounts are to be expended and that was done in the hearings before the House committee.

Senator UNDERWOOD. I have not examined those hearings. At what places is the board contemplating placing fortifications?

Gen. CROZIER. At the eastern entrance to Long Island Sound, at the southern entrance of New York, at Cape Henry. Certain of the appropriations are for installing special classes of guns. For instance some 12-inch guns that we already have on hand, installing them so mounted as to give specially long range. Those are to be scattered about pretty well, over all the coast; and similarly, some of these appropriations provide for antiaircraft guns, of which we have none. Those will be scattered pretty well about the fortifications of the coasts. The principal projects are the ones I have mentioned now, though.

FORTIFICATIONS ON PACIFIC COAST.

Senator JONES. Is there to be anything on the Pacific coast?

Gen. CROZIER. At Los Angeles—at San Pedro Harbor. Some of the antiaircraft guns will probably go there if there is any appropriation for increasing that further. Senator Jones was speaking of San Pedro.

Senator JONES. I said on the Pacific coast.

Gen. CROZIER. Oh, yes; on the Pacific coast. Some of those 12-inch guns mounted for long range will go to the Pacific coast, and some of the antiaircraft guns will go to the Pacific coast.

Senator JONES. Do you contemplate putting any fortifications with those guns in Grays Harbor?

Gen. CROZIER. No, sir.

Senator JONES. Or at Willapa Harbor?

Gen. CROZIER. No; Grays Harbor and Willapa Harbor have been considered several times, and the conclusion has been reached that there would be no advantage in placing seacoast fortifications there, but that their defense had best be left to the mobile army. I can add that we are expecting to purchase and now have under design heavier artillery, to be carried about in a mobile manner, either by railroad cars or automobile transportation, than we have ever used before. It is contemplated to use that in connection with the mobile army, which ought to be somewhere near those harbors in case of hostilities in that part of the world.

Senator JONES. What special reason is there for not putting fortifications on Grays Harbor, but leaving it rather to the mobile army, that does not apply to other localities?

Gen. CROZIER. That the harbors themselves offer no sufficient justification for an attack by a hostile fleet. What there is there is not such as would produce a sufficient effect upon the outcome of a war as to justify a hostile fleet in running the risk of taking them, which would be very great. The entrances to the harbors are not particularly good. Therefore the only purpose for which those harbors could be advantageously used would be in running comparatively light-draft vessels in there, perhaps transports, and landing a force of troops with the object of taking some other place, and that force of troops would best be met by a mobile army. We do not make any effort to fortify the whole coast of the United States in such a manner as to prevent hostile landings. That would require a scheme of fortification that would be much more expensive than we have ever contemplated.

Senator JONES. Yes; and that is one of the principal harbors, for instance, in the State of Washington. That is connected with transportation lines to one of the points where a hostile force would try to land.

Gen. CROZIER. If a hostile force should land there we would treat them in accordance with the general scheme, which supposes that we have plenty of people and plenty of resources in the country, if we will only make ready to use them, to take care of anybody that would ever place his foot on shore.

Senator JONES. But why do you not apply that also with reference to Tacoma and Seattle; with reference to Puget Sound?

Gen. CROZIER. We protect the whole Sound at the mouth of the Sound.

Senator JONES. Yes, I know. You have big fortifications there.

Gen. CROZIER. The fortifications have for their principal object the prevention of an enemy from doing inadmissible damage without coming ashore; that is, while he still remains aboard his ships. On Puget Sound Seattle and Tacoma are pretty large cities, and we have a navy yard there. Therefore, an enemy could come in there with

a fleet and without coming ashore could do damage which we would class as inadmissible. He could not do that in the existing state of affairs at Grays' Harbor or at Willapa Bay. It would be deplorable if those people should have their houses knocked about their ears, but it would be like the bombardment of Scarborough and other points on the English coast; it would not have any effect on the outcome of the war.

Senator JONES. These people out there have been pressing the matter pretty hard, and I wanted the record to show why you put fortifications at one point and not at another.

Gen. CROZIER. Yes.

FORTIFICATION OF DELAWARE BAY—AGAIN.

Senator SAULSBURY. General, you know that there has been a report, and I fancy you joined in it, from the War Department regarding the utilization of the Chesapeake and Delaware Canal, to the effect that a sea-level canal along its line would form an almost impassable obstacle to the passage of troops advancing to attack Wilmington or Philadelphia from the peninsula between Delaware and Chesapeake Bays.

Gen. CROZIER. That is the Delaware & Chesapeake Canal.

Senator SAULSBURY. Yes. Lewes Harbor is a fine harbor, and in one of the reports to the War Department, which is signed by Col. Flagler, that is stated, on investigation, to be the most vulnerable point on the Atlantic seaboard. I am only stating this for the comment you may make. That harbor, of course, is located at the mouth of the Delaware Bay, and is 120 miles from New York and 120 miles from the Chesapeake Capes. The harbor is only 101 miles from Philadelphia by an air line, and it is less than 100 miles from Baltimore, and it is just about 100 miles to Washington from this harbor. It is said in this report to be the best place for a landing which could be made the basis of offensive operations on the eastern seaboard.

This letter from the present Secretary of War, Mr. Baker, shows that your board of review has reconsidered the depth advised for that canal, the acquisition of which is recommended, from 18 feet to 25 feet, and also that that harbor should be defended in such a way as to deny possession to an enemy. Now, may I ask, is that included in your present estimates for that purpose?

Gen. CROZIER. No, sir; that is advised as a project to be taken up later.

Senator SAULSBURY. If those statements in those reports are correct as I have made them, practically—that is, if that is the most vulnerable point on the Atlantic seaboard, and there is a fine harbor absolutely undefended, and the distances which I have given are accurate—can you tell me why it has not been included, or whether it would be included, in these fortifications which are appropriated for in this bill?

Gen. CROZIER. I do not think the view has ever been accepted by the board of review that it is the most vulnerable point. It has been accepted that that is a vulnerable point. The worst point of that kind we now have is the mouth of the Chesapeake, which is

unfortified at present, and which leaves a large part of Chesapeake Bay exposed to a landing force. That, however, is to be appropriated for, according to the estimates this year.

The general scheme of the board of review was to provide for the scheme of fortification—sea-coast defense—which it adopted, to be completed in four years, or so that it should be completed with the appropriations made in four successive years. Among them was this project about the canal; but the limitation as to what we should include and what we should not include was fixed by that rule, that we should asked only for one-fourth at the beginning. That was a rule that was adopted by Mr. Garrison in his general scheme of defense, and which has been adhered to. That is the reason why some of these have been left out this year.

Senator SAULSBURY. You spoke about the canal and about sufficient fortifications to command that harbor and prevent a landing.

Gen. CROZIER. Although it is expected to put them there, they are not included in this year's estimates, Senator, because this place was not considered to be one of the worst.

Senator SAULSBURY. I do not think that that point itself is bad, but the whole peninsula can be overrun from that point; that is the point I was making. What would be the range of hydroaeroplanes from a base established at Lewes? Over what range could they operate?

Gen. CROZIER. They have operated over 100 miles.

Senator SAULSBURY. So that they could actually reach Washington from there, it being just about 100 miles?

Gen. CROZIER. Yes.

Senator SAULSBURY. And a small force that went in there could readily occupy a point on Chesapeake Bay, could it not?

Gen. CROZIER. Yes; but as I said a moment ago, we have got 100,000,000 people in this country, and we ought to be abundantly able to give a good account of anybody who will consent to come ashore; and if we do not do it, it will be because of some other kind of neglect than neglect of the seacoast fortifications.

Senator SAULSBURY. Yes; of course this is the report of the War College Division, of which Gen. Macomb is chief?

Gen. CROZIER. Yes. It came before us and we agreed in it and as to the Chesapeake & Delaware Canal.

Senator SAULSBURY. It refers to the Chesapeake & Delaware Canal as an impassable obstacle. You regard it as an approach to the munition factories located through the country north of there as a very important matter?

Gen. CROZIER. Yes.

Senator SAULSBURY. Might I ask when it is proposed to take that matter up? I do not want to interfere with any well considered scheme of operation, of course.

Gen. CROZIER. We have made a general list of projects in the order of their importance, but they have not been definitely passed upon except for the first year. Whether this would come in the second or the third year has not been definitely passed upon.

Senator SAULSBURY. I notice the installation of seacoast defenses on Delaware Bay has been recommended, provided it does not interfere with the general program adopted by the War Department. That is in paragraph No. 6 of this letter of the Secretary. The first

part of paragraph No. 6 has no relation to this. This is a letter to the chairman of the Military Committee of the Senate from the Secretary of War regarding a bill which I introduced for this special purpose.

Gen. CROZIER (after examining letter). Yes, that language means the Board of Review thinks that this a good project, and that it ought to be done, but it does not think that it should displace any of the items which are covered by the appropriations as they are now in the bill; that the sums which are mentioned here and which would be necessary to carry out this particular project are desirable.

Senator SAULSBURY. That they would be well expended?

Gen. CROZIER. Yes; well expended; but, as I said, it does not think that they are of such importance that they should take the place of any of those already in the bill.

Senator SAULSBURY. This, of course, is not included in this year's estimates?

Gen. CROZIER. No, sir; it is not. It would be a desirable addition to the estimates of this year or any other year.

PURCHASE OF CUSHINGS ISLAND, PORTLAND HARBOR, ME.

Senator UNDERWOOD. Senator Johnson said that he wanted to come before the committee on the matter mentioned in the following amendment:

To enable the Secretary of War to purchase all land on Cushing's Island, Portland Harbor, Me., not at present owned by the Government, \$650,000.

Do you know anything about that, General?

Gen. CROZIER. I can not tell you anything. We have some batteries on Cushings Island, and I think it is desirable to purchase the whole island, but whether that is included in the estimates for this year or not, I do not know.

(At this point Senator Johnson entered the committee room.)

STATEMENT OF HON. CHARLES F. JOHNSON, A SENATOR FROM THE STATE OF MAINE.

Senator JOHNSON of Maine. I have introduced a bill, Mr. Chairman, a very worthy, meritorious bill, which comes before your committee. The Government has established a fort on Cushings Island in Portland Harbor. There is a large hotel, the Ottawa House, on the other part of this island, and there are cottages on the island. It is not a large island. They can not discharge those guns there without shattering the glass in the windows in that hotel and in the cottages, and if guests are there it will disturb them. They want the rest of this ground for the practice and drill of the soldiers, and they ought to buy and own the whole island. That has been referred to the War Department, and I guess Secretary Garrison turned it down. I do not know whether Secretary Baker has or not. The Government ought to own the whole of that island.

Senator JONES. Is this a fort or a fortification? If it is a fort, it would come under the military bill.

Senator UNDERWOOD. I guess it is a fortification. There is a coast-defense organization there.

Senator JOHNSON of Maine. There is a coast-defense organization there, and they have had a lot of trouble. I do not know about the price of the island, but they ought to control it. I asked for \$650,000 for its purchase.

Senator UNDERWOOD. I think, under the plan of this bill, it is not customary to make an appropriation for any such specific purpose, but there is an appropriation in this bill, on page 3, line 15, which provides "For procurement or reclamation of land, or right pertaining thereto, needed for site, location, construction, or prosecution of works for fortifications and coast defenses, \$1,400,000." It is customary to make appropriations in this bill in that way, and to leave it to the War Department, or to the bureau that has that in charge, to make the expenditure; but it is a question whether the committee—there are only a small number of them here now—would take it up and increase that appropriation without an estimate.

Senator JONES. There is nothing to prevent them using the money appropriated there for the purchase of that island.

Senator JOHNSON of Maine. That is a pretty small amount for the whole coast.

Senator UNDERWOOD. I take it that it would require a particular estimate on it. There is here a report from the War Department, a letter from Secretary Baker.

Senator JOHNSON of Maine. This report reads as follows:

WAR DEPARTMENT,
Washington, March 31, 1916.

CHAIRMAN COMMITTEE ON APPROPRIATIONS,
United States Senate.

SIR: I am returning herewith a copy of an amendment intended to be proposed to the fortifications bill, for the purchase of the remainder of Cushings Island, Portland Harbor, at a cost of \$650,000, which copy has been referred to the department for report. The Government now owns a tract of 125.68 acres on Cushings Island, which tract is occupied by several seacoast batteries and is designated as Fort Levett. The acquisition by the Government of additional land on that island has been the subject of correspondence for a number of years. While additional land adjacent to the present reservation could be used advantageously, the price asked for such land has been considered excessive by the department. It may be said that in any case the entire island is not needed for military purposes, and it is believed that the amount proposed to be appropriated in the accompanying amendment is much in excess of the value of the benefits that would accrue to the Government from such purchase, particularly in view of the pressing necessity for large expenditures for other and urgent needs of the seacoast fortifications.

Very respectfully,

NEWTON D. BAKER, *Secretary of War.*

I have not anything further to say. They own a good part of that island, and there is a hotel on the other part, and I know they have great difficulty there when they discharge their guns.

Senator UNDERWOOD. When the full committee comes in I will call to their attention your suggestion about the matter. I doubt whether they would want to take it up without an estimate.

Senator JOHNSON of Maine. I doubt, in view of the adverse report of the department, whether they would take any action on it. It is right in sight of Portland. It is only a short distance out there. It is needed for the protection of Portland Harbor.

Senator JONES. Of course, the mere purchase of the additional land would not add anything to the present protective character of the battery.

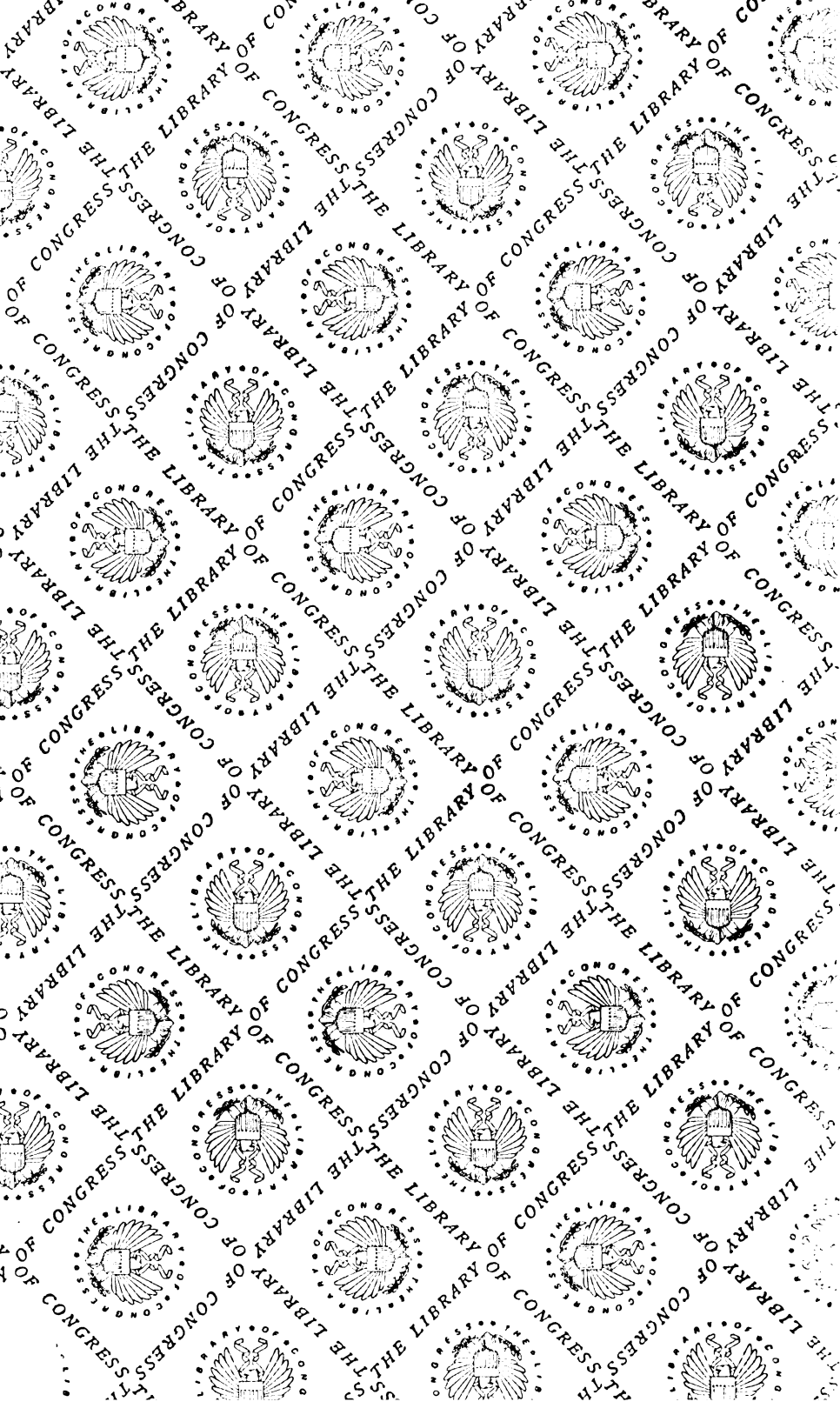
Senator JOHNSON of Maine. Yes; I think it would. They would have to put more guns there.

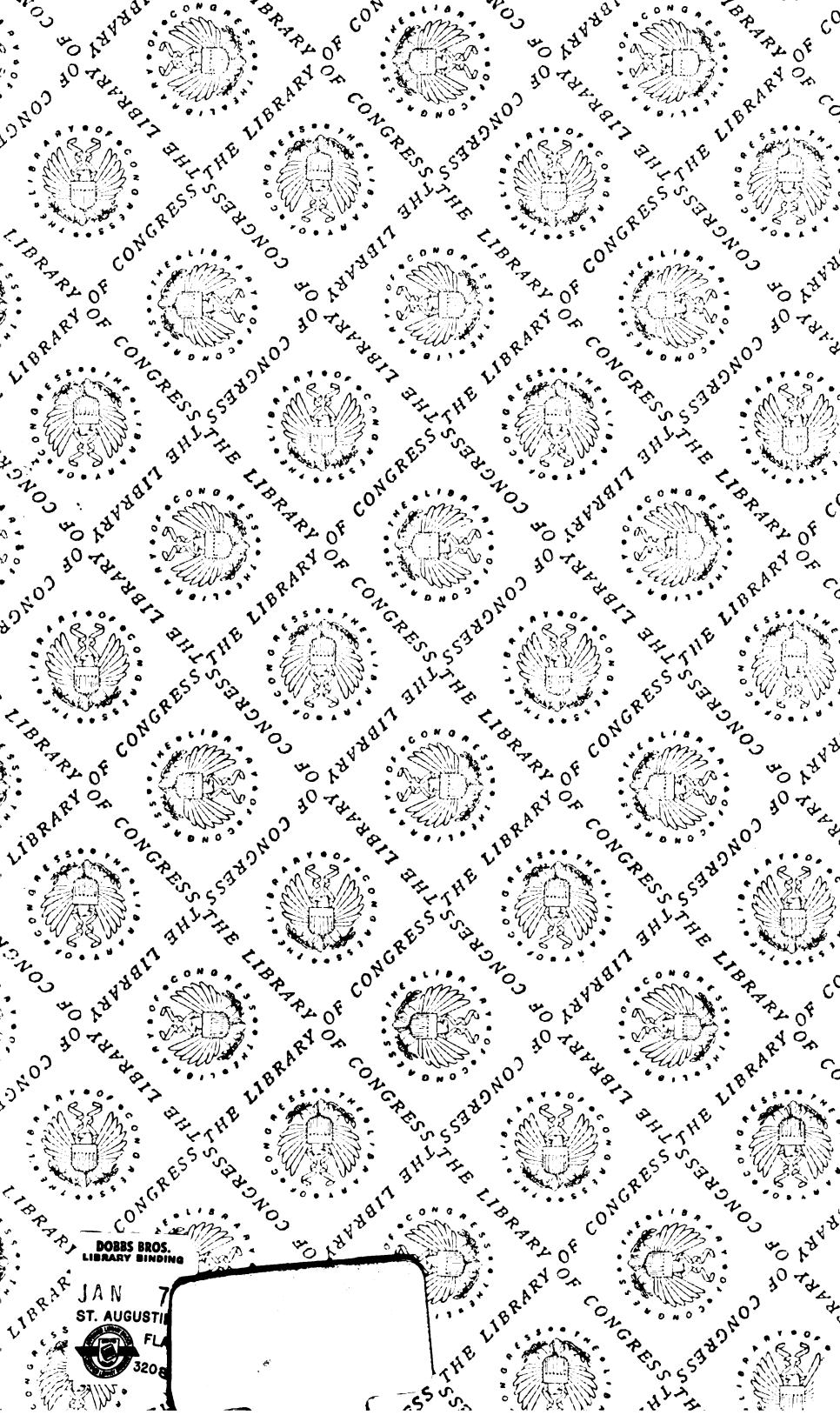
Senator JONES. Yes; of course they might put more guns there.

Senator JOHNSON of Maine. I have nothing further to say about it, gentlemen.

(At 1 o'clock p. m. the subcommittee adjourned subject to the call of the chairman.)

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